

Turbulence-driven ion beams in the magnetospheric Kelvin-Helmholtz instability

Original

Turbulence-driven ion beams in the magnetospheric Kelvin-Helmholtz instability / SORRISO-VALVO, Luca; Catapano, Filomena; Retino', Alessandro; Perrone, Denise; Roberts, Owen W.; Coburn, Jesse T.; Valentini, Francesco; Perri, Silvia; Greco, Antonella; Pezzi, Oreste; Fraternale, Federico; Raffaele Marino, And. - ELETTRONICO. - 21:(2019). (Intervento presentato al convegno European Geosciences Union General Assembly 2019 tenutosi a Vienna (Austria) nel 7–12 April 2019).

Availability:

This version is available at: 11583/2726423 since: 2019-02-27T11:28:38Z

Publisher:

European Geosciences Union (EGU)

Published

DOI:

Terms of use:

openAccess

This article is made available under terms and conditions as specified in the corresponding bibliographic description in the repository

Publisher copyright

(Article begins on next page)



Turbulence-driven ion beams in the magnetospheric Kelvin-Helmholtz instability

Luca Sorriso-Valvo (1,2), Filomena Catapano (3,8), Alessandro Retino^{*} (4), Denise Perrone (5), Owen W. Roberts (6), Jesse T. Coburn (7,8), Francesco Valentini (8), Silvia Perri (8), Antonella Greco (8), Oreste Pezzi (8,9), Federico Fraternali (10), and Raffaele Marino (11)

(1) Departamento de Física, Escuela Politécnica Nacional, Quito, Ecuador (lucasorriso@gmail.com), (2) Nanotec - CNR, Liquid Crystal Laboratory, Rende, Italy (lucasorriso@gmail.com), (3) SERCO per ESA-ESRINO, Frascati, Italy, (4) LPP-CNRS/Ecole Polytechnique/Sorbonne University, Paris, France, (5) Department of Physics, Imperial College of London, London United Kingdom, (6) Space Research Institute, Austrian Academy of Sciences, Graz, Austria, (7) Department of Physics and Astronomy, Queen Mary University of London, UK, (8) Dipartimento di Fisica, Università della Calabria, Rende, Italy, (9) Gran Sasso Science Institute, L'Aquila, Italy, (10) Dipartimento di Scienza Applicata e Tecnologia, Politecnico di Torino, Italy, (11) Laboratoire de Mécanique des Fluides et d'Acoustique, CNRS, Ecole Centrale de Lyon, France

The description of the local turbulent energy transfer via a heuristic proxy derived from the third-order moment scaling law, and the high-resolution ion distributions measured by the Magnetospheric Multiscale mission, together provide a formidable tool to explore the cross-scale connection between the fluid-scale energy cascade and plasma processes at sub-ion scales. Using magnetospheric boundary layers measurements, we show that when the small-scale energy transfer is dominated by Alfvénic, correlated velocity and magnetic field fluctuations, beams of accelerated particles are more likely observed. Here, for the first time we report observations suggesting the nonlinear wave-particle interaction as one possible mechanism for the energy dissipation in space plasmas.